

## CLAIMS

### WHAT IS CLAIMED IS:

5           1.     An isolated polynucleotide with human prothrombinase activity comprising a nucleotide sequence of SEQ ID NO: 2 or 3, the mature protein coding portion thereof, or the active domain thereof.

10           2.     An isolated polynucleotide encoding a polypeptide with biological activity, said polynucleotide which hybridizes to the complement of a polynucleotide of claim 1 under stringent hybridization conditions.

15           3.     An isolated polynucleotide encoding a polypeptide with biological activity, said polynucleotide having greater than about 90% sequence identity with the polynucleotide of claim 1.

            4.     The polynucleotide of claim 1 which is a DNA sequence.

20           5.     An isolated polynucleotide which comprises the complement of the polynucleotide of claim 1.

            6.     A vector comprising the polynucleotide of claim 1.

25           7.     An expression vector comprising the polynucleotide of claim 1.

            8.     A host cell genetically engineered to express the polynucleotide of claim 1.

9. A host cell genetically engineered to contain the polynucleotide of claim 1 in operative association with a regulatory sequence that controls expression of the polynucleotide in the host cell.

10. An isolated polypeptide comprising an amino acid selected from the group consisting of SEQ ID NO: 4-9, the mature protein portion thereof, and active domain thereof.

11. A composition comprising the polypeptide of claim 10 and a carrier.

12. An antibody directed against the polypeptide of claim 10.

13. A method for detecting the polynucleotide of claim 1 in a sample, comprising:

a) contacting the sample with a compound that binds to and forms a complex with the polynucleotide of claim 1 for a period sufficient to form the complex; and

b) detecting the complex, so that if a complex is detected, the polynucleotide of claim 1 is detected.

14. A method for detecting the polynucleotide of claim 1 in a sample, comprising:

a) contacting the sample under stringent hybridization conditions with nucleic acid primers that anneal to the polynucleotide of claim 1 under such conditions;

b) amplifying a product comprising at least a portion of the polynucleotide of claim 1; and

c) detecting said product and thereby the polynucleotide of claim 1 in the sample.

15. The method of claim 14, wherein the polynucleotide is an RNA molecule that encodes a polypeptide of claim 10, and the method further comprises reverse transcribing an annealed RNA molecule into a cDNA polynucleotide.

5 16. A method for detecting the polypeptide of claim 10 in a sample, comprising:

a) contacting the sample with a compound that binds to and forms a complex with the polypeptide under conditions and for a period sufficient to form the complex; and

10 b) detecting formation of the complex, so that if a complex formation is detected, the polypeptide of claim 10 is detected.

17. A method for identifying a compound that binds to the polypeptide of claim 10, comprising:

15 a) contacting the compound with the polypeptide of claim 10 under conditions and for a time sufficient to form a polypeptide/compound complex; and

b) detecting the complex, so that if the polypeptide/compound complex is detected, a compound that binds to the polypeptide of claim 10 is identified.

20 18. A method for identifying a compound that binds to the polypeptide of claim 10, comprising:

a) contacting the compound with the polypeptide of claim 10, in a cell, for a time sufficient to form a polypeptide/compound complex, wherein the complex drives expression of a reporter gene sequence in the cell; and

25 b) detecting the complex by detecting reporter gene sequence expression, so that if the polypeptide/compound complex is detected, a compound that binds to the polypeptide of claim 10 is identified.

19. A method of producing the polypeptide of claim 10, comprising,

30 a) culturing the host cell of claim 8 for a period of time sufficient to express the polypeptide in said cell; and

b) isolating the polypeptide from the cell culture or cells of step (a).

20. A kit comprising the polypeptide of claim 10.

5 21. A nucleic acid array comprising the polynucleotide of claim 1 or a unique segment of the polynucleotide of claim 1 attached to a surface.

10 22. The array of claim 21, wherein the array detects full-matches to the polynucleotide or a unique segment of the polynucleotide of claim 1.

23. The array of claim 21, wherein the array detects mismatches to the polynucleotide or a unique segment of the polynucleotide of claim 1.

15 24. A method of treatment comprising administering to a mammalian subject in need thereof a therapeutic amount of a composition comprising a polypeptide of claim 10 and a pharmaceutically acceptable carrier.

20 25. A polypeptide having prothrombinase activity comprising at least ten consecutive amino acids from the group consisting of SEQ ID NO: 4-9.

26. The polypeptide of claim 26, comprising at least five consecutive amino acids from the group consisting of SEQ ID NO: 4-9.

25 27. A polynucleotide encoding a polypeptide according to claim 25.

28. A polynucleotide encoding a polypeptide according to claim 26.

29. A polynucleotide encoding a polypeptide according to claim 10.

30. An isolated polypeptide with prothrombinase activity having at least an amino acid sequence of SEQ ID NO: 9, wherein A = Alanine, C = Cysteine,

D=Aspartic Acid, E= Glutamic Acid, F=Phenylalanine, G=Glycine, H=Histidine,  
I=Isoleucine, K=Lysine, L=Leucine, M=Methionine, N=Asparagine, P=Proline,  
Q=Glutamine, R=Arginine, S=Serine, T=Threonine, V=Valine, W=Tryptophan,  
Y=Tyrosine.

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